

# PSEUDO-CODE FOR CENBLOCK PROGRAM

- get\_parameters;
- setup\_grid;
- attach\_mesh\_areas;
- while over\_max\_pop do  
adjust\_grid\_areas;
- build\_serving\_areas;

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# get\_parameters;

Loads user-defined values for parameters, including size of grid, maximum allowable population within a distribution area, size of microgrid (if user desires to preset this), and take rate for households.

```
setup_grid;
```

Using data from included Census blocks, calculates upper left and lower right corners of area to be "gridded." Writes corners of grid blocks to file.

# Mountain Bell - MT Census Blocks



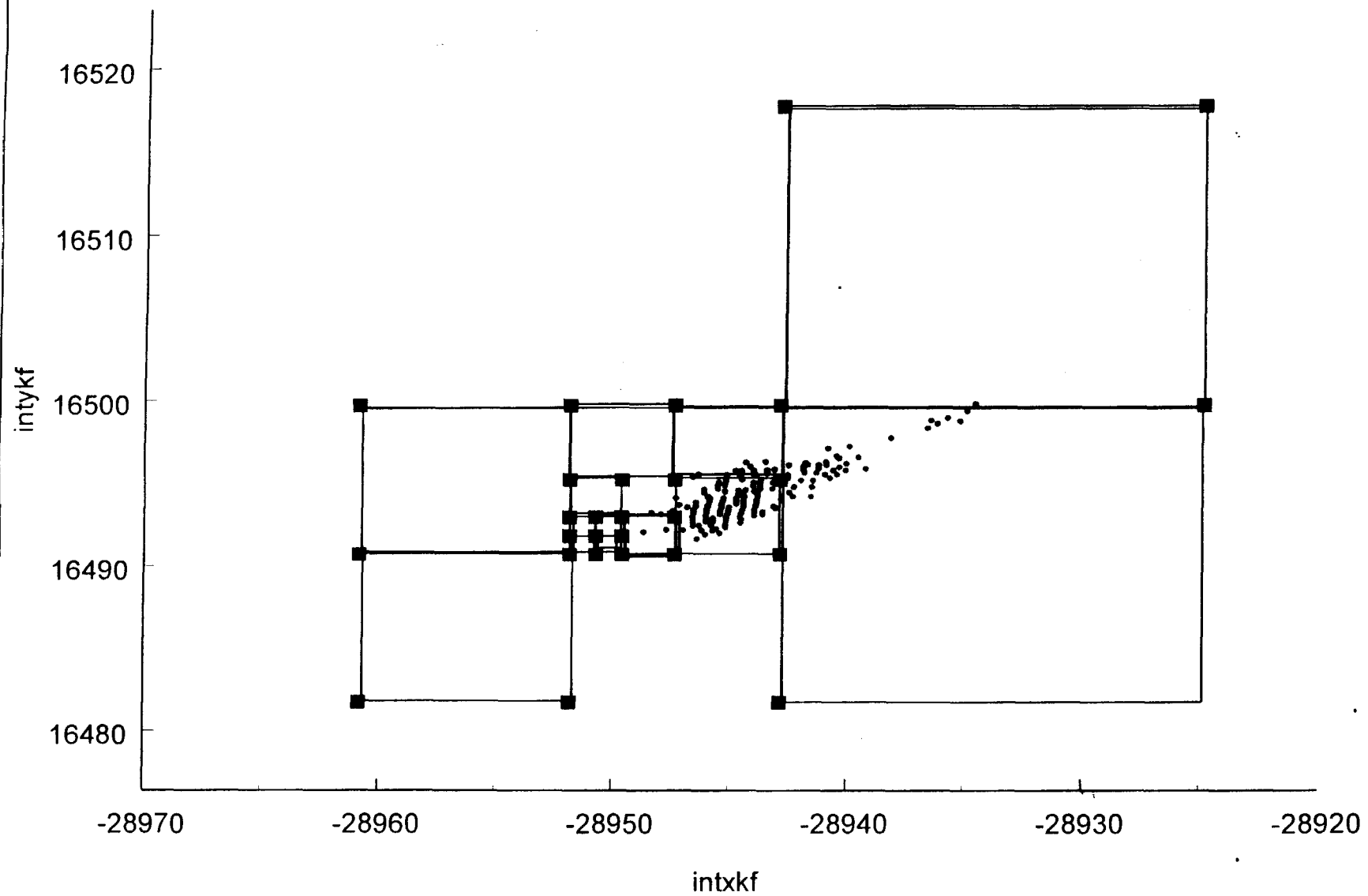
```
attach_mesh_areas;
```

Loops through each grid block created above, and attaches all Census blocks that fall within that grid by saving "addresses" in a file. Also tabulates the number of lines within each grid block and saves info to file.

```
while over_max_pop do  
    adjust_grid_areas;
```

Over\_max\_pop is a Boolean function that returns "TRUE" if any grid block has a number of lines over the maximum defined in the parameter file. If any such grid blocks exist, adjust\_grid\_areas divides them into smaller square grids and determines which Census blocks are attached to the smaller grids.

Illustration of subdividing gridblocks to handle "overpopulation"



```
build_serving_areas;
```

This module accomplishes two tasks  
before writing distribution area data  
to file



# Sets up microgrid within each grid block

It grids each grid block to determine the location of the Census blocks contained within it. If this microgrid is preset by the user, it will use that value; otherwise, it will determine the average area of included Census blocks to determine a microgrid size.

# Optimize SAI locations

Optimizes the location of each serving area interface by minimizing a “cost function” that assigns a penalty to any SAI location:

$$Cost(x, y) = \begin{cases} 1.0 \times 10^{16}, & \text{if } \exists i \text{ s.t. } d([x, y], [xmid_i, ymid_i]) > 18 \\ \sum_i d([x, y], [xmid_i, ymid_i]) \times pop_i, & \text{otherwise} \end{cases}$$

number of rows, cols: 22,22

Lower Left X, Y: -28832.7347 16286.8341

NS Grid size: 0.8182

EW Grid size: 0.8182

Centroid: -28827.8256,16290.9250

Household matrix:

[illegible]

# More than one SAI?

The program now asks the question,  
“if we were to put more than one  
SAI in this gridblock, where would  
the SAIs be?” and performs  
location optimization of up to four  
SAIs